

**PHYTOMYZA HELLEBORI KALTENBACH (DIP.: AGROMYZIDAE),
A RECENT ADDITION TO THE BRITISH FAUNA: FURTHER RECORDS
IN EAST NORTHAMPTONSHIRE, HUNTINGDONSHIRE
AND CAMBRIDGESHIRE**

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ON 23 MARCH 2000 my wife Joan asked me what was causing the older leaves on practically every plant in a large clump of *Helleborus foetidus* in our rural garden at Hemington, east Northamptonshire (grid reference TL 091852), to shrivel and die. Closer examination showed the apparently dead, brown, areas of each leaf to be the result of a severe infestation of a species of leaf-miner. I am certain that I recall noticing similarly shrivelled leaves in previous years, but never in such numbers. The mines were restricted to last year's evergreen leaves on the lower parts of each plant, with very few individual leaflets (3-11 per leaf) appearing devoid of a single mine. The new season's growth was unaffected. I soon realised that the causal agent was most probably a dipterous leaf-miner in the family Agromyzidae. Reference to an ancient German work by Kaltenbach (1874) provided a possible answer. He described a new species, *Phytomyza hellbori* from material collected by Ernst Hofmann mining the leaves of *Helleborus niger* at Stuttgart during May. This species was not included in the latest Diptera Checklist (Chandler, 1998). Two days later at the AGM of the Huntingdonshire Fauna & Flora Society I described the leaf mines to the (vice) county recorders for Diptera – Jon Cole, and Lepidoptera – Barry Dickerson. Neither knew of any species which mined the leaves of *Helleborus* in this country.

On 26 March, I collected about a dozen mined leaves, close examination of which revealed there to frequently be more than one larval mine in each leaflet. These typically start at, or near, the midrib and while in some the mines remain separate, in others they cross over each other or fuse together (Figure1). Multiple occupancy could be determined by the presence of puparia with their spiracles protruding from either leaf surface. These leaves were stored in a plastic sandwich box indoors in my study and by 5 April 16 ♂♂ and 11 ♀♀ agromyzid flies had emerged together with five chalcidoid parasites. By the following day a further 14 ♂♂ and 5 ♀♀ agromyzids, and four more chalcids had emerged. About this time I received a photocopy of Spencer's (1976) description of *Phytomyza hellebori* Kalt. from Jon Cole, and dissection of the aedeagus of a reared male conformed to the figure (743) for that species. Believing that I or, strictly speaking, my wife had discovered an agromyzid new to Britain I promptly dispatched those specimens which had emerged on 5 April to the Natural History Museum, London. The next day's emergence was sent to Jon Cole.

As one would expect emergence to be advanced through bringing the mined leaves into a centrally heated house, several *H. foetidus* plants in the garden were tapped over a tray on 6 April to see what insects were present on them. Three female

agromyzids collected in this way appeared identical to those reared indoors from the leaf mines. Seventeen species of Coleoptera were also recorded, the majority of which were obviously casual strays, half of which were phytophagous species known to be associated with other host plants. Only the ladybird, *Coccinella septempunctata* L., and the two species of predatory Staphylinidae, *Tachyporus dispar* (Paykul) and *T. pallidus* Sharp, were probably feeding on the heavy infestation of *Macrosiphon hellebori* Theobald & Watson, an aphid which Ian Woivod informs me is "holocyclic and monoecious on *Helleborus niger*, *H. viridis* L. and *H. foetidus*". Some small parasitic Hymenoptera were collected at the same time but released as there was no guarantee that they were in any way associated with the *Helleborus*, let alone its insect fauna. A further 4♂♂ and 7♀♀ agromyzids, together with three chalcids and five ichneumonoid parasites, had emerged by 11 April after which only the occasional single specimen of each species was seen in the plastic box containing the mined *Helleborus* leaves.

After examining the flies sent to him Jon Cole noted a number of discrepancies in colouration compared with that given by Spencer (1976) in his account of Scandinavian Agromyzidae. Spencer described the scutellum as "broadly yellow centrally, but black at sides", whereas Cole found 5♂♂ and 1♀ with the scutellum all black, 4♂♂ and 3♀♀ with centre to apex vaguely pale, and 5♂♂ and 1♀ with a distinct yellow stripe. Spencer gave the "humerus, notopleural area and upper half of mesopleuron, bright yellow". Cole found the notopleuron black in 2♂♂ and 2♀♀; patchily darkened in 10♂♂ and 3♀♀; and bright yellow in 2♂♂ and 2♀♀; with the mesopleuron yellow in the upper quarter only. Spencer gives "coxae and femora yellow". Cole found the front coxae variably pale in apical half only; mid and hind coxae nearly all black, and in 2♂♂ and 1♀ the femora were black with a yellow tip while the rest had variable dark streaks and patches, not noticeably paler than the brownish tibiae. To a non-dipterist like myself the pure white halteres appeared particularly distinctive.

Although it seemed likely that the Hymenoptera reared from the mined leaves would prove to be broad spectrum rather than specific parasites they were sent to my old friend and chalcid expert Dick Askew. He identified them as being two species of Eulophidae – 7♂♂ and 4♀♀ *Diglyphus minoens* (Walker, 1838), which he comments are "known chiefly as an ectoparasitoid of larvae of *Napomyza*, *Phytomyza* (Agromyzidae), but occasionally reported from *Phyllonorycter* (Lepidoptera; Gracillariidae)". The second species, *Elachertus (Hyssopus) nigrifulus* (Zetterstedt, 1838) was represented by a single female, of which Askew states – "well known to attack microlepidoptera (Tortricidae, Cosmopterygidae, etc.) but I have no other report from Diptera". He was also able to identify the 3♂♂ and 2♀♀ ichneumonids as *Colastes braconius* Halliday, 1833 (Brachonidae). He comments that this species "is usually a parasitoid of Lepidoptera, especially Gracillariidae, and I cannot recall any records from Agromyzidae". In more recent correspondence Mark Shaw informs me that although *C. braconius* "is a very regular parasitoid of some species of *Phyllonorycter* it is probably even better known as a parasitoid of Agromyzidae (particularly agricultural pests)". In his experience "it is a generalist on

leaf-mines, on both trees and low plants, of Lepidoptera, Diptera, Coleoptera (e.g. *Rhynchaeus fagi* [L.]), but only rarely Hymenoptera". Of the *Elachertus* record Askew remarks that "all other species (of this genus) seem to be primary or secondary parasitoids of Lepidoptera", and that my "record from *Phytomyza* must be questionable unless you have irrefutable evidence that this was indeed the host". In order to double check for any other possible host, each of the twelve leaves which had remained sealed in a plastic box, was thoroughly examined leaflet by leaflet. The only pupae and skins from parasitised larvae found in the *P. hellebori* mines were all dipterous. No indication of anything lepidopterous could be found and, on this evidence, one can only assume that the parasites all had *P. hellebori* as their host.

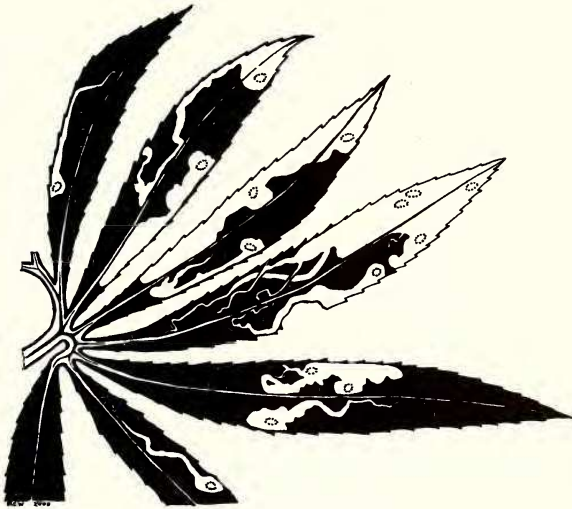


Fig. 1. Leaf of *Helleborus foetidus* L. showing mines of *Phytomyza hellebori* Kaltenschach (Dip.: Agromyzidae). Dotted ovals indicate the positions of puparia.

Whilst awaiting Askew's parasite determinations I met David Henshaw at an entomological fair in Kettering on 16 April only to be told that Alan Stubbs had pre-empted me by three months in recording *P. hellebori* mining *Helleborus foetidus* in his Peterborough garden, approximately 17.5 km north-east of Hemington. I immediately telephoned him to learn that he had also found it mining *H. foetidus* in a presumed natural population in Bedford Purlieus National Nature Reserve, some 17 kilometres north by north-west of Hemington (see Gent & Wilson, 1995). He had already submitted an account bringing *Phytomyza hellebori* forward as a species new to Britain (Stubbs, 2000) which included additional records by Andrew Halstead from the Royal Horticultural Society's gardens at Wisley, Surrey, and from a garden at Royston, Hertfordshire. A search in Hemington revealed the presence of mined *H. foetidus* in the gardens of two of my immediate neighbours and in the churchyard (TQ 091849).

Inquiry of Terry Wells, botanical recorder for Vice County 31, Huntingdonshire, indicated that *H. foetidus* had been recorded from two sites in the southwest of the county, at West Wood, Ellington and Stow Longa churchyard. I

visited both sites on 18 April but found no plants at either site. On the same day I visited the house at Wyton (TL 271725) from which we had obtained our original stock of *H. foetidus* over 25 years ago. The present owners, Mr & Mrs Hepworth, showed me the few plants still present in their garden, all of which were mined. That same day former colleagues Jane Croft and Mark Telfer searched plants in their Huntingdonshire gardens and reported *H. foetidus* mined at Stow Longa (TL 107769) and St. Ives (TL 306727) respectively. Later, on 24 April Sheila Wells confirmed the presence of mines in the same host at Upwood (TL 256824). More recently Peter Wood has informed me of a further infestation on *Helleborus foetidus* in his Cambridge garden (TL 450595).

Clearly *Phytomyza hellebori* has already been shown to be widely distributed in East Northamptonshire and the Soke of Peterborough (VC 32), Huntingdonshire (VC 31) and Cambridgeshire (VC 29) and David Henshaw has informed me that he has more recent records from mid-Essex. Other entomologists who saw Alan Stubbs' exhibit at the British Entomological & Natural History Society's meeting on 11th January will doubtless, by now, have discovered its presence elsewhere in the southern counties of England. At present *P. hellebori* has only been found mining *H. foetidus* in England. Alan Stubbs, Jon Cole and I all have other species of *Helleborus* growing in our gardens, and Andrew Halstead examined other species at Wisley, but none showed any signs of leaf mining.

Acknowledgements

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